Please cancel claims 3-4, 13-14, 35-36, 42, 45-46, 55-56, 77-78, and 84, and amend claims 1-2, 5-6, 9-12, 15-16, 23-30, 37-39, 43-44, 47-48, 51-54, 57-58, 65-72, and 79-81 as follows:

1.   (Currently Amended) A polygon drawing apparatus which draws a polygon by performing intensity processing on a polygon to be drawn using an anti-aliasing method based on an intensity value generated by an intensity value generating device, said intensity value generating device comprising:

an edge calculating device which calculates line intersection data associated with an intersecting portion between each of edges of the polygon to be drawn, [[and]] for [[each]] a given one scan line, using vertex coordinates of the polygon to be drawn, the line intersection data including a first pair of outside intersection and inside intersection that represent intersecting positions between said [[each]] given one scan line and one of the edges that is located on an upstream side as viewed in a scanning direction, a second pair of outside intersection and inside intersection that represent intersection positions between said [[each]] given one scan line and one of the edges that is located on a downstream side as viewed in the scanning direction, an increasing rate at which an intensity value increases from the outside intersection to the inside intersection of said first pair, and a decreasing rate at which the intensity value decreases from the inside intersection to the outside intersection of said second pair, wherein the line intersection data is determined based on trajectories obtained by dragging a diamond-like box between vertices of the polygon to be drawn, said diamond-like box having diagonal dimensions in two coordinate axis directions and each of the diagonal dimensions being equal to a grid width; and

a scan line processing device which sequentially calculates with respect to said given one scan line the intensity value to be given to each portion of the polygon in the scanning direction with respect to said each scan line, based on the line intersection data obtained calculated for said [[each]] given one scan line by said edge calculating device,

wherein said edge calculating device and said scan line processing device operate alternately during processing for said given one scan line, whereby a polygon is drawn.

2.   (Currently Amended) A polygon drawing apparatus according to claim 1, wherein said edge calculating device comprises:

means for calculating a first pair of positions on lattice points of displayed grid boxes that are located adjacent, respectively, to a pair of real intersections between said [[each]] given one scan line and said one of said edges that is located on the upstream side as viewed in the scanning direction, on the downstream side as viewed in the scanning direction, to obtain said first pair of outside intersection and inside intersection;

means for calculating a second pair of positions on lattice points of the displayed grid boxes that are located adjacent, respectively, to a pair of real intersections between said [[each]] given one scan line and said one of said edges that is located on the downstream side as viewed in the scanning direction, on the upstream side as viewed in the scanning direction, to obtain said second pair of outside intersection and inside intersection; and

means for calculating a first initial value from the intensity value at the outside intersection of said first pair, and a second initial value from the intensity value at a lattice point of one of the displayed grid boxes that is located adjacent to the inside intersection of said second pair on the downstream side as viewed in the scanning direction.

3-4.   (Cancelled)

5.   (Currently Amended) A polygon drawing apparatus according to claim 1, wherein said scan line processing device comprises:

means for generating the intensity value to be given to each portion of the polygon along the scanning direction in a range from the outside intersection to the inside intersection of said first pair for said [[each]] given one scan line, by progressively increasing the intensity value at said increasing rate in said range from the outside intersection to the inside intersection of said first pair for said [[each]] given one scan line;

means for generating a constant intensity value to be given to each portion of said polygon along the scanning direction in a range from the inside intersection of said first pair to the inside intersection of said second pair for said [[each]] given one scan line; and

means for generating the intensity value to be given to each portion of the polygon along the scanning direction in a range from the inside intersection to the outside intersection of said second pair for said [[each]] <u>given one</u> scan line, by progressively decreasing the intensity value at said decreasing rate in said range from the inside intersection to the outside intersection of said second pair for said [[each]] <u>given one</u> scan line.

6.   (Currently Amended) A polygon drawing apparatus according to claim 2, wherein said scan line processing device comprises:

means for generating the intensity value to be given to each portion of the polygon along the scanning direction in a range from the outside intersection to the inside intersection of said first pair for said [[each]] <u>given one</u> scan line, by progressively increasing the intensity value at said increasing rate in said range from the outside intersection to the inside intersection of said first pair for said [[each]] <u>given one</u> scan line;

means for generating a constant intensity value to be given to each portion of said polygon along the scanning direction in a range from the inside intersection of said first pair to the inside intersection of said second pair for said [[each]] <u>given one</u> scan line; and

means for generating the intensity value to be given to each portion of the polygon along the scanning direction in a range from the inside intersection to the outside intersection of said second pair for said [[each]] <u>given one</u> scan line, by progressively decreasing the intensity value at said decreasing rate in said range from the inside intersection to the outside intersection of said second pair for said [[each]] <u>given one</u> scan line.

7.   (Previously Presented) A polygon drawing apparatus according to claim 5, wherein said increasing rate is determined based on a slope of the edge on the upstream side as viewed in the scanning direction, and said decreasing rate is determined based on a slope of the edge on the downstream side as viewed in the scanning direction.

8.   (Previously Presented) A polygon drawing apparatus according to claim 6, wherein said increasing rate is determined based on a slope of the edge on the upstream side as

viewed in the scanning direction, and said decreasing rate is determined based on a slope of the edge on the downstream side as viewed in the scanning direction.

9.   (Currently Amended) A polygon drawing method of drawing a polygon by performing intensity processing on a polygon to be drawn using an anti-aliasing method based on an intensity value generated by an intensity value generating step, said intensity value generating step comprising:

an edge calculating step of calculating line intersection data associated with an intersecting portion between each of edges of the polygon to be drawn, [[and]] for [[each]] a given one scan line, using vertex coordinates of the polygon to be drawn, said line intersection data including a first pair of outside intersection and inside intersection that represent intersecting positions between said [[each]] given one scan line and one of the edges that is located on an upstream side as viewed in a scanning direction, a second pair of outside intersection and inside intersection that represent intersection positions between said [[each]] given one scan line and one of the edges that is located on a downstream side as viewed in the scanning direction, an increasing rate at which an intensity value increases from the outside intersection to the inside intersection of said first pair, and a decreasing rate at which the intensity value decreases from the inside intersection to the outside intersection of said second pair, wherein the line intersection data is determined based on trajectories obtained by dragging a diamond-like box between vertices of the polygon to be drawn, said diamond-like box having diagonal dimensions in two coordinate axis directions and each of the diagonal dimensions being equal to a grid width; and

a scan line processing step which sequentially calculates with respect to said given one scan line the intensity value to be given to each portion of the polygon in the scanning direction with respect to said each scan line, based on the line intersection data obtained calculated for said [[each]] given one scan line by said edge calculating step,

wherein said edge calculating step and said scan line processing step operate alternately during processing for said given one scan line, whereby a polygon is drawn.

10.   (Currently Amended) A storage medium which stores a program that enables implementation of a method of drawing a polygon by performing intensity processing

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on a polygon to be drawn using an anti-aliasing method based on an intensity value generated by an intensity value generating [[step]]module, said intensity value generating [[step]]module comprising:

an edge calculating [[step]]module of calculating line intersection data associated with an intersecting portion between each of edges of the polygon to be drawn, [[and]] for [[each]] a given one scan line, using vertex coordinates of the polygon to be drawn, said line intersection data including a first pair of outside intersection and inside intersection that represent intersecting positions between said [[each]] given one scan line and one of the edges that is located on an upstream side as viewed in a scanning direction, a second pair of outside intersection and inside intersection that represent intersection positions between said [[each]] given one scan line and one of the edges that is located on a downstream side as viewed in the scanning direction, an increasing rate at which an intensity value increases from the outside intersection to the inside intersection of said first pair, and a decreasing rate at which the intensity value decreases from the inside intersection to the outside intersection of said second pair, wherein the line intersection data is determined based on trajectories obtained by dragging a diamond-like box between vertices of the polygon to be drawn, said diamond-like box having diagonal dimensions in two coordinate axis directions and each of the diagonal dimensions being equal to a grid width; and

a scan line processing [[step]]module which sequentially calculates with respect to said given one scan line the intensity value to be given to each portion of the polygon in the scanning direction with respect to said each scan line, based on the line intersection data obtained calculated for said [[each]] given one scan line by said edge calculating [[step]]module,

wherein said edge calculating module and said scan line processing module operate alternately during processing for said given one scan line, whereby a polygon is drawn.

11. (Currently Amended) A polygon drawing apparatus which draws a polygon by drawing a polygon by performing intensity processing on a polygon to be drawn using an anti-aliasing method based on an intensity value generated by an intensity value generating device, said intensity value generating device comprising:

an edge calculating device which ~~derives~~ calculates line intersection data associated with an intersecting portion between each of edges of the polygon to be drawn, [[and]] <u>for</u> [[each]] <u>a given one</u> scan line, using vertex coordinates of the polygon to be drawn, said line intersection data including a first pair of outside intersection and inside intersection that represent intersecting positions between said [[each]] <u>given one</u> scan line and one of the edges that is located on an upstream side as viewed in a scanning direction, a second pair of outside intersection and inside intersection that represent intersection positions between said [[each]] <u>given one</u> scan line and one of the edges that is located on a downstream side as viewed in the scanning direction, an increasing rate at which an intensity value increases from the outside intersection to the inside intersection of said first pair, and a decreasing rate at which the intensity value decreases from the inside intersection to the outside intersection of said second pair<u>, wherein the line intersection data is determined based on trajectories obtained by dragging a diamond-like box between vertices of the polygon to be drawn, said diamond-like box having diagonal dimensions in two coordinate axis directions and each of the diagonal dimensions being equal to a grid width</u>; and

a scan line processing device which ~~sequentially~~ calculates <u>with respect to said given one scan line</u> the intensity value to be given to each portion of the polygon in the scanning direction ~~with respect to said each scan line~~, based on the line intersection data ~~obtained~~ <u>calculated</u> for said [[each]] <u>given one</u> scan line by said edge calculating device, by performing first processing for calculating changes in the intensity value from the outside intersection to the inside intersection of said first pair for each scan line, second processing for calculating changes in the intensity value from the inside intersection to the outside intersection of said second pair for each scan line, and third processing for combining results obtained in said first processing and said second processing, said first processing, said second processing and said third processing being performed in parallel with each other<u>,</u>

<u>wherein said edge calculating device and said scan line processing device operate alternately during processing for said given one scan line, whereby a polygon is drawn</u>.

12.   (Currently Amended) A polygon drawing apparatus according to claim 11, wherein said edge calculating device comprises:

means for calculating a first pair of positions on lattice points of displayed grid boxes that are located adjacent, respectively, to a pair of real intersections between said [[each]] given one scan line and said one of said edges that is located on the upstream side as viewed in the scanning direction, on the downstream side as viewed in the scanning direction, to obtain said first pair of outside intersection and inside intersection;

means for calculating a second pair of positions on lattice points of the displayed grid boxes that are located adjacent, respectively, to a pair of real intersections between said [[each]] given one scan line and said one of said edges that is located on the downstream side as viewed in the scanning direction, to obtain said second pair of outside intersection and inside intersection; and

means for calculating a first initial value from the intensity value at the outside intersection of said first pair, and a second initial value from the intensity value at a lattice point of one of displayed grid boxes that is located adjacent to the inside intersection of said second pair on the downstream side as viewed in the scanning direction.

13-14. (Cancelled)

15.   (Currently Amended) A polygon drawing apparatus according to claim 11, wherein said scan processing device comprises:

means for performing said first processing by generating the intensity value by progressively increasing the intensity value at said increasing rate in a range from the outside intersection to the inside intersection of said first pair for said [[each]] given one scan line and generating a constant intensity value in a range following the inside intersection of said first pair;

means for performing said second processing by generating the intensity value by progressively decreasing the intensity value at an absolute value of said decreasing rate in a range from the inside intersection to the outside intersection of said second pair for said [[each]] given one scan line and generating said constant intensity value in a range following the outside intersection of said second pair; and

means for performing said third processing by subtracting a result of said second processing from a result of said first processing.

16. (Currently Amended) A polygon drawing apparatus according to claim 12, wherein said scan processing device comprises:

means for performing said first processing by generating the intensity value by progressively increasing the intensity value at said increasing rate in a range from the outside intersection to the inside intersection of said first pair for said [[each]] given one scan line and generating a constant intensity value in a range following the inside intersection of said first pair;

means for performing said second processing by generating the intensity value by progressively decreasing the intensity value at an absolute value of said decreasing rate in a range from the inside intersection to the outside intersection of said second pair for said [[each]] given one scan line and generating said constant intensity value in a range following the outside intersection of said second pair; and

means for performing said third processing by subtracting a result of said second processing from a result of said first processing.

17. (Previously Presented) A polygon drawing apparatus according to claim 15, wherein said increasing rate is determined based on a slope of the edge on the upstream side as viewed in the scanning direction, and said decreasing rate is determined based on a slope of the edge on the downstream side as viewed in the scanning direction.

18. (Previously Presented) A polygon drawing apparatus according to claim 16, wherein said increasing rate is determined based on a slope of the edge on the upstream side as viewed in the scanning direction, and said decreasing rate is determined based on a slope of the edge on the downstream side as viewed in the scanning direction.

19. (Previously Presented) A polygon drawing apparatus according to claim 15, wherein when a vertex of the polygon is located between two adjacent scan lines, said scan processing device sets said constant intensity value to a value that depends upon a distance from one of the two adjacent scan lines to said vertex.

20. (Previously Presented) A polygon drawing apparatus according to claim 16, wherein when a vertex of the polygon is located between two adjacent scan lines, said scan processing device sets said constant intensity value to a value that depends upon a distance from one of the two adjacent scan lines to said vertex.

21. (Previously Presented) A polygon drawing apparatus according to claim 11, wherein when a vertex other than vertices at upper and lower ends of the polygon is located between two adjacent scan lines, said scan processing device separately performs processing based on a first distance from the upper one of the two adjacent scan lines to said vertex, and performs processing based on a second distance from the lower one of the two adjacent scan lines to said vertex, and calculates the intensity value by combining results of said processing based on said first distance and said processing based on said second distance.

22. (Previously Presented) A polygon drawing apparatus according to claim 12, wherein when a vertex other than vertices at upper and lower ends of the polygon is located between two adjacent scan lines, said scan processing device separately performs processing based on a first distance from the upper one of the two adjacent scan lines to said vertex, and performs processing based on a second distance from the lower one of the two adjacent scan lines to said vertex, and calculates the intensity value by combining results of said processing based on said first distance and said processing based on said second distance.

23. (Currently Amended) A polygon drawing method of drawing a polygon by performing intensity processing on a polygon to be drawn using an anti-aliasing method based on an intensity value generated by an intensity value generating step, said intensity value generating step comprising:

an edge calculating step of calculating line intersection data associated with an intersecting portion between each of edges of the polygon to be drawn, [[and]] for [[each]] a given one scan line, using vertex coordinates of the polygon to be drawn, said line intersection data including a first pair of outside intersection and inside intersection that represent intersecting positions between said [[each]] given one scan line and one of the edges that is located on an upstream side as viewed in a scanning direction, a second pair of outside intersection and inside intersection that represent intersection positions between said [[each]] given one scan line and one of the edges that is located on a downstream side as viewed in the scanning direction, an increasing rate at which an intensity value increases from the outside intersection to the inside intersection of said first pair, and a decreasing rate at which the intensity

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value decreases from the inside intersection to the outside intersection of said second pair, wherein the line intersection data is determined based on trajectories obtained by dragging a diamond-like box between vertices of the polygon to be drawn, said diamond-like box having diagonal dimensions in two coordinate axis directions and each of the diagonal dimensions being equal to a grid width; and

a scan line processing step of ~~sequentially~~ calculating with respect to said given one scan line the intensity value to be given to each portion of the polygon in the scanning direction ~~with respect to said each scan line~~, based on the line intersection data ~~obtained~~ calculated for said [[each]] given one scan line by said edge calculating step, by performing first processing for calculating changes in the intensity value from the outside intersection to the inside intersection of said first pair for each scan line; second processing for calculating changes in the intensity value from the inside intersection to the outside intersection of said second pair for each scan line, and third processing for combining results obtained in said first processing and said second processing, said first processing, said second processing and said third processing being performed in parallel with each other,

wherein said edge calculating step and said scan line processing step operate alternately during processing for said given one scan line, whereby a polygon is drawn.

24.   (Currently Amended) A storage medium which stores a program that enables implementation of a method of drawing a polygon by performing intensity processing on a polygon to be drawn using an anti-aliasing method based on an intensity value generated by an intensity value generating [[step]]module, said intensity value generating [[step]]module comprising:

an edge calculating [[step]]module of calculating line intersection data associated with an intersecting portion between each of edges of the polygon to be drawn, [[and]] for [[each]] a given one scan line, using vertex coordinates of the polygon to be drawn, said line intersection data including a first pair of outside intersection and inside intersection that represent intersecting positions between said [[each]] given one scan line and one of the edges that is located on an upstream side as viewed in a scanning direction, a second pair of outside intersection and inside intersection that represent intersection positions between said [[each]] given one scan line and one of the edges that is located on a downstream side as viewed in the

scanning direction, an increasing rate at which an intensity value increases from the outside intersection to the inside intersection of said first pair, and a decreasing rate at which the intensity value decreases from the inside intersection to the outside intersection of said second pair, wherein the line intersection data is determined based on trajectories obtained by dragging a diamond-like box between vertices of the polygon to be drawn, said diamond-like box having diagonal dimensions in two coordinate axis directions and each of the diagonal dimensions being equal to a grid width; and

a scan line processing [[step]]module of sequentially calculating with respect to said given one scan line the intensity value to be given to each portion of the polygon in the scanning direction with respect to said each scan line, based on the line intersection data obtained calculated for said [[each]] given one scan line by said edge calculating [[step]]module, by performing first processing for calculating changes in the intensity value from the outside intersection to the inside intersection of said first pair for each scan line; second processing for calculating changes in the intensity value from the inside intersection to the outside intersection of said second pair for each scan line, and third processing for combining results obtained in said first processing and said second processing, said first processing, said second processing and said third processing being performed in parallel with each other,

wherein said edge calculating module and said scan line processing module operate alternately during processing for said given one scan line, whereby a polygon is drawn.

25. (Currently Amended) A polygon drawing apparatus which draws a polygon by combining a plurality of triangles and by performing intensity processing on a polygon to be drawn using an anti-aliasing method based on an intensity value generated by an intensity value generating device, said intensity value generating device comprising:

an edge calculating device which receives a drawing command including vertex coordinates of each of the triangles to be drawn and a control bit which indicates whether each edge of each of the triangles is to be drawn, and derives calculates line intersection data relating to a position of an intersecting portion between said each edge of each of the triangles [[and]] for [[each]] a given one scan line, using the vertex coordinates of each of the triangles to be drawn and the

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control bit, and an intensity value of the intersecting portion, based on said control bit, wherein the line intersection data is determined based on trajectories obtained by dragging a diamond-like box between vertices of each of the triangles to be drawn, said diamond-like box having diagonal dimensions in two coordinate axis directions and each of the diagonal dimensions being equal to a grid width; and

a scan line processing device which sequentially calculates with respect to said given one scan line the intensity value to be given to each portion of each of the triangles in the scanning direction with respect to said each scan line, based on the line intersection data obtained calculated for said [[each]] given one scan line by said edge calculating device,

wherein said edge calculating device and said scan line processing device operate alternately during processing for said given one scan line, whereby a polygon is drawn.

26. (Currently Amended) A polygon drawing apparatus which draws a polygon by combining a plurality of triangles and by performing intensity processing on the plurality of triangles to be drawn using an anti-aliasing method based on an intensity value generated by an intensity value generating device, said intensity value generating device comprising:

an edge calculating device which receives a drawing command including vertex coordinates of each of the triangles to be drawn and a control bit which indicates whether intensity processing is to be performed on each edge of each of the triangles, and calculates line intersection data associated with an intersecting portion between each edge of each of the triangles to be drawn [[and]] for [[each]] a given one scan line, using the vertex coordinates of each of the triangles to be drawn and the control bit, said line intersection data including a first pair of outside intersection and inside intersection that represent intersecting positions between said [[each]] given one scan line and one of the edges that is located on an upstream side as viewed in a scanning direction, a second pair of outside intersection and inside intersection that represent intersection positions between said [[each]] given one scan line and one of the edges that is located on a downstream side as viewed in the scanning direction, an increasing rate at which an intensity value increases from the outside intersection to the inside intersection of said first pair, a decreasing rate at which the intensity value decreases from the inside intersection to the outside intersection of said second

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pair, and an intensity value that is set to 1 when said control bit indicates that no intensity processing is to be performed on said each edge of each of the triangles, wherein the line intersection data is determined based on trajectories obtained by dragging a diamond-like box between vertices of each of the triangles to be drawn, said diamond-like box having diagonal dimensions in two coordinate axis directions and each of the diagonal dimensions being equal to a grid width; and

        a scan line processing device which ~~sequentially~~ calculates with respect to said given one scan line the intensity value to be given to each portion of each of the triangles in the scanning direction ~~with respect to said each scan line~~, based on the line intersection data ~~obtained~~ calculated for said [[each]] given one scan line by said edge calculating device,

        wherein said edge calculating device and said scan line processing device operate alternately during processing for said given one scan line, whereby a polygon is drawn.

27.   (Currently Amended) A polygon drawing apparatus which draws a polygon by combining a plurality of triangles and by performing intensity processing on the plurality of triangles to be drawn using an anti-aliasing method based on an intensity value generated by an intensity value generating device, said intensity value generating device comprising:

        an edge calculating device which receives a drawing command including vertex coordinates of each of the triangles to be drawn and a first control bit which indicates whether each edge of each of the triangles is to be drawn, and a second control bit which indicates whether intensity processing is to be performed on each edge of each of the triangles, and calculates line intersection data associated with an intersecting portion between each edge of each of the triangles to be drawn [[and]] for [[each]] a given one scan line, using the vertex coordinates of each of the triangles to be drawn and the first and second control bits, said line intersection data including a first pair of outside intersection and inside intersection that represent intersecting positions between said [[each]] given one scan line and one of the edges that is located on an upstream side as viewed in a scanning direction, a second pair of outside intersection and inside intersection that represent intersection positions between said [[each]] given one scan line and one of the edges that is located on a downstream side as viewed in the scanning direction, an increasing rate at which an

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intensity value increases from the outside intersection to the inside intersection of said first pair, a decreasing rate at which the intensity value decreases from the inside intersection to the outside intersection of said second pair, and an intensity value that is set to 0 when said first control bit indicates that said each edge of each of the triangles is not to be drawn, said intensity value being set to 1 when said second control bit indicates that the intensity processing is not to be performed on said each edge of each of the triangles, wherein the line intersection data is determined based on trajectories obtained by dragging a diamond-like box between vertices of each of the triangles to be drawn, said diamond-like box having diagonal dimensions in two coordinate axis directions and each of the diagonal dimensions being equal to a grid width; and

a scan line processing device which ~~sequentially~~ calculates with respect to said given one scan line the intensity value to be given to each portion of each of the triangles in the scanning direction ~~with respect to said each scan line~~, based on the line intersection data ~~obtained~~ calculated for said [[each]] given one scan line by said edge calculating device,

wherein said edge calculating device and said scan line processing device operate alternately during processing for said given one scan line, whereby a polygon is drawn.

28.   (Currently Amended) A polygon drawing method of drawing a plurality of triangles so as to draw a polygon by combining the plurality of triangles and by performing intensity processing on a polygon to be drawn using an anti-aliasing method based on an intensity value generated by an intensity value generating step, said intensity value generating step comprising the steps of:

inputting a drawing command including vertex coordinates of each of the triangles to be drawn and a control bit which indicates whether each edge of each of the triangles is to be drawn;

an edge calculating step of calculating line intersection data relating to a position of an intersecting portion between said each edge of each of the triangles for a given one scan line, using the vertex coordinates of each of the triangles to be drawn and the control bit, and an intensity value of the intersecting portion, based on said control bit, wherein the line intersection data is determined based on trajectories obtained by dragging a diamond-like box between vertices of each of the

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triangles to be drawn, said diamond-like box having diagonal dimensions in two coordinate axis directions and each of the diagonal dimensions being equal to a grid width, wherein the line intersection data is determined based on trajectories obtained by dragging a diamond-like box between vertices of the polygon to be drawn, said diamond-like box having diagonal dimensions in two coordinate axis directions and each of the diagonal dimensions being equal to a grid width; and

a scan line processing step of calculating with respect to said given one scan line the intensity value to be given to each portion of each of the triangles in the scanning direction, based on the line intersection data calculated for said given one scan line by said edge calculating step,

~~drawing an interior of each of the triangles with a predetermined intensity using the vertex coordinates of each of the triangles to be drawn and the control bit, while determining an intensity value of said each edge of each of the triangles by referring to said control bit when drawing said each edge of each of the triangles~~

wherein said edge calculating step and said scan line processing step operate alternately during processing for said given one scan line, whereby a polygon is drawn.

29. (Currently Amended) A polygon drawing method of drawing a polygon by combining a plurality of triangles and by performing intensity processing on the plurality of triangles to be drawn using an anti-aliasing method based on an intensity value generated by an intensity value generating step, said intensity value generating step comprising the steps of:

inputting a drawing command including vertex coordinates of each of the triangles to be drawn and a control bit which indicates whether intensity processing is to be performed on each edge of each of the triangles;

an edge calculating step of calculating line intersection data relating to a position of an intersecting portion between said each edge of each of the triangles for a given one scan line, using the vertex coordinates of each of the triangles to be drawn and the control bit, and an intensity value of the intersecting portion, based on said control bit, wherein the line intersection data is determined based on trajectories obtained by dragging a diamond-like box between vertices of each of the triangles to be drawn, said diamond-like box having diagonal dimensions in two coordinate axis directions and each of the diagonal dimensions being equal to a grid

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width, wherein the line intersection data is determined based on trajectories obtained by dragging a diamond-like box between vertices of the polygon to be drawn, said diamond-like box having diagonal dimensions in two coordinate axis directions and each of the diagonal dimensions being equal to a grid width; and

a scan line processing step of calculating with respect to said given one scan line the intensity value to be given to each portion of each of the triangles in the scanning direction, based on the line intersection data calculated for said given one scan line by said edge calculating step,

~~drawing an interior of each of the triangles with a predetermined intensity using the vertex coordinates of each of the triangles to be drawn and the control bit, while determining an intensity value of said each edge of each of the triangles by referring to said control bit when drawing said each edge of each of the triangles~~

wherein said edge calculating step and said scan line processing step operate alternately during processing for said given one scan line, whereby a polygon is drawn.

30. (Currently Amended) A polygon drawing method of drawing a polygon by combining a plurality of triangles and by performing intensity processing on the plurality of triangles to be drawn using an anti-aliasing method based on an intensity value generated by an intensity value generating step, said intensity value generating step comprising the steps of:

inputting a drawing command including vertex coordinates of each of the triangles to be drawn and a first control bit which indicates whether each edge of each of the triangles is to be drawn, and a second control bit which indicates whether intensity processing is to be performed on each edge of each of the triangles;

an edge calculating step of calculating line intersection data relating to a position of an intersecting portion between said each edge of each of the triangles for a given one scan line, using the vertex coordinates of each of the triangles to be drawn and the control bit, and an intensity value of the intersecting portion, based on said control bit, wherein the line intersection data is determined based on trajectories obtained by dragging a diamond-like box between vertices of each of the triangles to be drawn, said diamond-like box having diagonal dimensions in two coordinate axis directions and each of the diagonal dimensions being equal to a grid width, wherein the line intersection data is determined based on trajectories obtained

by dragging a diamond-like box between vertices of the polygon to be drawn, said diamond-like box having diagonal dimensions in two coordinate axis directions and each of the diagonal dimensions being equal to a grid width; and

a scan line processing step of calculating with respect to said given one scan line the intensity value to be given to each portion of each of the triangles in the scanning direction, based on the line intersection data calculated for said given one scan line by said edge calculating step,

~~drawing an interior of each of the triangles with a predetermined intensity using the vertex coordinates of each of the triangles to be drawn and the control bit, while determining an intensity value of said each edge of each of the triangles by referring to said control bit when drawing said each edge of each of the triangles~~

wherein said edge calculating step and said scan line processing step operate alternately during processing for said given one scan line, whereby a polygon is drawn.

31. (Previously Presented) A polygon drawing method according to claim 28, wherein the intensity value is determined by a ratio of an intensity value of a pixel that is to be drawn, to an intensity value of a pixel that is originally located at a position where the pixel to be drawn exists, and wherein

when said control bit indicates that said each edge of each of the triangles is not to be drawn, the intensity value of the pixel to be drawn is set to 0.

32. (Previously Presented) A polygon drawing method according to claim 30, wherein the intensity value is determined by a ratio of an intensity value of a pixel that is to be drawn, to an intensity value of a pixel that is originally located at a position where the pixel to be drawn exists, and wherein
when said control bit indicates that said each edge of each of the triangles is not to be drawn, the intensity value of the pixel to be drawn is set to 0.

33. (Previously Presented) A polygon drawing method according to claim 29, wherein the intensity value is determined by a ratio of an intensity value of a pixel that is to be drawn to an intensity value of a pixel that is originally located at a position where the pixel to be drawn exists, and wherein

when said control bit indicates that the intensity processing is not to be performed on said each edge of each of the triangles, the intensity value of the pixel to be drawn is set to 1.

34.   (Previously Presented) A polygon drawing method according to claim 30, wherein the intensity value is determined by a ratio of an intensity value of a pixel that is to be drawn to an intensity value of a pixel that is originally located at a position where the pixel to be drawn exists, and wherein

when said control bit indicates that the intensity processing is not to be performed on said each edge of each of the triangles, the intensity value of the pixel to be drawn is set to 1.

35-36. (Cancelled)

37.   (Currently Amended) A storage medium that stores a program that enables implementation of a polygon drawing method of drawing a plurality of triangles so as to draw a polygon by combining the plurality of triangles and by performing intensity processing on a polygon to be drawn using an anti-aliasing method based on an intensity value generated by an intensity value generating [[step]]module, said intensity value generating [[step]]module comprising the [[step]]modules of:

an inputting module of inputting a drawing command including vertex coordinates of each of the triangles to be drawn and a control bit which indicates whether each edge of each of the triangles is to be drawn;

an edge calculating module of calculating line intersection data relating to a position of an intersecting portion between said each edge of each of the triangles for a given one scan line, using the vertex coordinates of each of the triangles to be drawn and the control bit, and an intensity value of the intersecting portion, based on said control bit, wherein the line intersection data is determined based on trajectories obtained by dragging a diamond-like box between vertices of each of the triangles to be drawn, said diamond-like box having diagonal dimensions in two coordinate axis directions and each of the diagonal dimensions being equal to a grid width, wherein the line intersection data is determined based on trajectories obtained by dragging a diamond-like box between vertices of the polygon to be drawn, said

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diamond-like box having diagonal dimensions in two coordinate axis directions and each of the diagonal dimensions being equal to a grid width; and

a scan line processing module of calculating with respect to said given one scan line the intensity value to be given to each portion of each of the triangles in the scanning direction, based on the line intersection data calculated for said given one scan line by said edge calculating module,

~~drawing an interior of each of the triangles with a predetermined intensity using the vertex coordinates of each of the triangles to be drawn and the control bit, while determining an intensity value of said each edge of each of the triangles by referring to said control bit when drawing said each edge of each of the triangles~~

wherein said edge calculating module and said scan line processing module operate alternately during processing for said given one scan line, whereby a polygon is drawn.

38.   (Currently Amended) A storage medium that stores a program that enables implementation of a polygon drawing method of drawing a polygon by combining a plurality of triangles and by performing intensity processing on the plurality of triangles to be drawn using an anti-aliasing method based on an intensity value generated by an intensity value generating [[step]]module, said intensity value generating [[step]]module comprising the [[step]]modules of:

an inputting module of inputting a drawing command including vertex coordinates of each of the triangles to be drawn and a control bit which indicates whether intensity processing is to be performed on each edge of each of the triangles;

an edge calculating module of calculating line intersection data relating to a position of an intersecting portion between said each edge of each of the triangles for a given one scan line, using the vertex coordinates of each of the triangles to be drawn and the control bit, and an intensity value of the intersecting portion, based on said control bit, wherein the line intersection data is determined based on trajectories obtained by dragging a diamond-like box between vertices of each of the triangles to be drawn, said diamond-like box having diagonal dimensions in two coordinate axis directions and each of the diagonal dimensions being equal to a grid width, wherein the line intersection data is determined based on trajectories obtained by dragging a diamond-like box between vertices of the polygon to be drawn, said

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diamond-like box having diagonal dimensions in two coordinate axis directions and each of the diagonal dimensions being equal to a grid width; and

a scan line processing module of calculating with respect to said given one scan line the intensity value to be given to each portion of each of the triangles in the scanning direction, based on the line intersection data calculated for said given one scan line by said edge calculating module,

~~drawing an interior of each of the triangles with a predetermined intensity using the vertex coordinates of each of the triangles to be drawn and the control bit, while determining an intensity value of said each edge of each of the triangles by referring to said control bit when drawing said each edge of each of the triangles~~

wherein said edge calculating module and said scan line processing module operate alternately during processing for said given one scan line, whereby a polygon is drawn.

39.   (Currently Amended) A storage medium that stores a program that enables implementation of a polygon drawing method of drawing a polygon by combining a plurality of triangles and by performing intensity processing on the plurality of triangles to be drawn using an anti-aliasing method based on an intensity value generated by an intensity value generating [[step]]module, said intensity value generating [[step]]module comprising the [[step]]modules of:

an inputting module of inputting a drawing command including vertex coordinates of each of the triangles to be drawn and a first control bit which indicates whether each edge of each of the triangles is to be drawn, and a second control bit which indicates whether intensity processing is to be performed on each edge of each of the triangles;

an edge calculating module of calculating line intersection data relating to a position of an intersecting portion between said each edge of each of the triangles for a given one scan line, using the vertex coordinates of each of the triangles to be drawn and the control bit, and an intensity value of the intersecting portion, based on said control bit, wherein the line intersection data is determined based on trajectories obtained by dragging a diamond-like box between vertices of each of the triangles to be drawn, said diamond-like box having diagonal dimensions in two coordinate axis directions and each of the diagonal dimensions being equal to a grid width, wherein the line intersection data is determined based on trajectories obtained

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by dragging a diamond-like box between vertices of the polygon to be drawn, said diamond-like box having diagonal dimensions in two coordinate axis directions and each of the diagonal dimensions being equal to a grid width; and

a scan line processing module of calculating with respect to said given one scan line the intensity value to be given to each portion of each of the triangles in the scanning direction, based on the line intersection data calculated for said given one scan line by said edge calculating module,

~~drawing an interior of each of the triangles with a predetermined intensity using the vertex coordinates of each of the triangles to be drawn and the control bit, while determining an intensity value of said each edge of each of the triangles by referring to said control bit when drawing said each edge of each of the triangles~~

wherein said edge calculating module and said scan line processing module operate alternately during processing for said given one scan line, whereby a polygon is drawn.

40. (Previously Presented) A polygon drawing method according to claim 30, wherein the intensity value is determined by a ratio of an intensity value of a pixel that is to be drawn, to an intensity value of a pixel that is originally located at a position where the pixel to be drawn exists, and wherein

when said control bit indicates that each edge of the triangles is not to be drawn, the intensity value of the pixel to be drawn is set to 0.

41. (Previously Presented) A polygon drawing method according to claim 30, wherein the intensity value is determined by a ratio of an intensity value of a pixel that is to be drawn to an intensity value of a pixel that is originally located at a position where the pixel to be drawn exists, and wherein

when said control bit indicates that the intensity processing is not to be performed on said each edge of each of the triangles, the intensity value of the pixel to be drawn is set to 1.

42. (Cancelled)

43. (Currently Amended) A polygon drawing apparatus which draws a polygon by performing intensity processing on a polygon to be drawn using an anti-aliasing

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method based on an intensity value generated by an intensity value generating device, said intensity value generating device comprising:

an edge calculating device which calculates line intersection data associated with an intersecting portion between each of edges of the polygon to be drawn, [[and]] for [[each]] a given one scan line, using the vertex coordinates of the polygon to be drawn, the line intersection data including a first pair of outside intersection and inside intersection that represent intersecting positions between said [[each]] given one scan line and one of the edges that is located on an upstream side as viewed in a scanning direction, a second pair of outside intersection and inside intersection that represent intersection positions between said [[each]] given one scan line and one of the edges that is located on a downstream side as viewed in the scanning direction, an increasing rate at which an intensity value increases from the outside intersection to the inside intersection of said first pair, and a decreasing rate at which the intensity value decreases from the inside intersection to the outside intersection of said second pair, wherein the line intersection data is determined based on trajectories obtained by dragging a diamond-like box between vertices of the polygon to be drawn, said diamond-like box having diagonal dimensions in two coordinate axis directions and each of the diagonal dimensions being equal to a grid width; and

a scan line processing device which ~~sequentially~~ calculates with respect to said given one scan line the intensity value to be given to each portion of the polygon in the scanning direction ~~with respect to said each scan line~~, based on the line intersection data ~~obtained~~ calculated for said [[each]] given one scan line by said edge calculating device, said scan line processing device including means for maintaining the intensity value of said each portion inside the polygon constant while gradually changing the intensity value of said each portion along each edge of the polygon,

wherein said edge calculating device and said scan line processing device operate alternately during processing for said given one scan line, whereby a polygon is drawn.

44.   (Currently Amended) A polygon drawing apparatus according to claim 43, wherein said edge calculating device comprises:

means for calculating a first pair of positions on lattice points of displayed grid boxes that are located adjacent, respectively, to a pair of real intersections between said [[each]] given one scan line and said one of said edges that is located on the

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upstream side as viewed in the scanning direction, on the downstream side as viewed in the scanning direction, to obtain said first pair of outside intersection and inside intersection;

means for calculating a second pair of positions on lattice points of the displayed grid boxes that are located adjacent, respectively, to a pair of real intersections between said [[each]] given one scan line and said one of said edges that is located on the downstream side as viewed in the scanning direction, on the upstream side as viewed in the scanning direction, to obtain said second pair of outside intersection and inside intersection; and

means for calculating a first initial value from the intensity value at the outside intersection of said first pair, and a second initial value from the intensity value at a lattice point of one of the displayed grid boxes that is located adjacent to the inside intersection of said second pair on the downstream side as viewed in the scanning direction.

45-46. (Cancelled)

47.   (Currently Amended) A polygon drawing apparatus according to claim 43, wherein said scan line processing device comprises:

means for generating the intensity value to be given to each portion of the polygon along the scanning direction in a range from the outside intersection to the inside intersection of said first pair for said [[each]] given one scan line, by progressively increasing the intensity value at said increasing rate in said range from the outside intersection to the inside intersection of said first pair for said [[each]] given one scan line;

means for generating a constant intensity value to be given to each portion of said polygon along the scanning direction in a range from the inside intersection of said first pair to the inside intersection of said second pair for said [[each]] given one scan line; and

means for generating the intensity value to be given to each portion of the polygon along the scanning direction in a range from the inside intersection to the outside intersection of said second pair for said [[each]] given one scan line, by progressively decreasing the intensity value at said decreasing rate in said range from

the inside intersection to the outside intersection of said second pair for said [[each]] given one scan line.

48. (Currently Amended) A polygon drawing apparatus according to claim 44, wherein said scan line processing device comprises:

   means for generating the intensity value to be given to each portion of the polygon along the scanning direction in a range from the outside intersection to the inside intersection of said first pair for said [[each]] given one scan line, by progressively increasing the intensity value at said increasing rate in said range from the outside intersection to the inside intersection of said first pair for said [[each]] given one scan line;

   means for generating a constant intensity value to be given to each portion of said polygon along the scanning direction in a range from the inside intersection of said first pair to the inside intersection of said second pair for said [[each]] given one scan line; and

   means for generating the intensity value to be given to each portion of the polygon along the scanning direction in a range from the inside intersection to the outside intersection of said second pair for said [[each]] given one scan line, by progressively decreasing the intensity value at said decreasing rate in said range from the inside intersection to the outside intersection of said second pair for said [[each]] given one scan line.

49. (Previously Presented) A polygon drawing apparatus according to claim 47, wherein said increasing rate is determined based on a slope of the edge on the upstream side as viewed in the scanning direction, and said decreasing rate is determined based on a slope of the edge on the downstream side as viewed in the scanning direction.

50. (Previously Presented) A polygon drawing apparatus according to claim 48, wherein said increasing rate is determined based on a slope of the edge on the upstream side as viewed in the scanning direction, and said decreasing rate is determined based on a slope of the edge on the downstream side as viewed in the scanning direction.

51. (Currently Amended) A polygon drawing method of drawing a polygon by performing intensity processing on a polygon to be drawn using an anti-aliasing method based on

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an intensity value generated by an intensity value generating step, said intensity value generating step comprising:

an edge calculating step of calculating line intersection data associated with an intersecting portion between each of edges of the polygon to be drawn, [[and]] for [[each]] a given one scan line, using the vertex coordinates of the polygon to be drawn, said line intersection data including a first pair of outside intersection and inside intersection that represent intersecting positions between said [[each]] given one scan line and one of the edges that is located on an upstream side as viewed in a scanning direction, a second pair of outside intersection and inside intersection that represent intersection positions between said [[each]] given one scan line and one of the edges that is located on a downstream side as viewed in the scanning direction, an increasing rate at which an intensity value increases from the outside intersection to the inside intersection of said first pair, and a decreasing rate at which the intensity value decreases from the inside intersection to the outside intersection of said second pair, wherein the line intersection data is determined based on trajectories obtained by dragging a diamond-like box between vertices of the polygon to be drawn, said diamond-like box having diagonal dimensions in two coordinate axis directions and each of the diagonal dimensions being equal to a grid width; and

a scan line processing step of sequentially calculating with respect to said given one scan line the intensity value to be given to each portion of the polygon in the scanning direction with respect to said each scan line, based on the line intersection data obtained calculated for said [[each]] given one scan line by said edge calculating step, said edge calculating step including a step of maintaining the intensity value of said each portion inside the polygon constant while gradually changing the intensity value of said each portion along each edge of the polygon,

wherein said edge calculating step and said scan line processing step operate alternately during processing for said given one scan line, whereby a polygon is drawn.

52. (Currently Amended) A storage medium which stores a program that enables implementation of a method of drawing a polygon by performing intensity processing on a polygon to be drawn using an anti-aliasing method based on an intensity value

generated by an intensity value generating [[step]]module, said intensity value generating [[step]]module comprising:

an edge calculating [[step]]module of calculating line intersection data associated with an intersecting portion between each of edges of the polygon to be drawn, [[and]] for [[each]] a given one scan line, using the vertex coordinates of the polygon to be drawn, said line intersection data including a first pair of outside intersection and inside intersection that represent intersecting positions between said [[each]] given one scan line and one of the edges that is located on an upstream side as viewed in a scanning direction, a second pair of outside intersection and inside intersection that represent intersection positions between said [[each]] given one scan line and one of the edges that is located on a downstream side as viewed in the scanning direction, an increasing rate at which an intensity value increases from the outside intersection to the inside intersection of said first pair, and a decreasing rate at which the intensity value decreases from the inside intersection to the outside intersection of said second pair, wherein the line intersection data is determined based on trajectories obtained by dragging a diamond-like box between vertices of the polygon to be drawn, said diamond-like box having diagonal dimensions in two coordinate axis directions and each of the diagonal dimensions being equal to a grid width; and

a scan line processing [[step]]module of sequentially calculating with respect to said given one scan line the intensity value to be given to each portion of the polygon in the scanning direction with respect to said each scan line, based on the line intersection data obtained calculated for said [[each]] given one scan line by said edge calculating [[step]]module, said edge calculating step including a step of maintaining the intensity value of said each portion inside the polygon constant while gradually changing the intensity value of said each portion along each edge of the polygon,

wherein said edge calculating module and said scan line processing module operate alternately during processing for said given one scan line, whereby a polygon is drawn.

53. (Currently Amended) A polygon drawing apparatus which draws a polygon by drawing a polygon by performing intensity processing on a polygon to be drawn using an anti-aliasing method based on an intensity value generated by an intensity value generating device, said intensity value generating device comprising:

an edge calculating device which calculates line intersection data associated with an intersecting portion between each of edges of the polygon to be drawn, [[and]] for [[each]] a given one scan line, using the vertex coordinates of the polygon to be drawn, said line intersection data including a first pair of outside intersection and inside intersection that represent intersecting positions between said [[each]] given one scan line and one of the edges that is located on an upstream side as viewed in a scanning direction, a second pair of outside intersection and inside intersection that represent intersection positions between said [[each]] given one scan line and one of the edges that is located on a downstream side as viewed in the scanning direction, an increasing rate at which an intensity value increases from the outside intersection to the inside intersection of said first pair, and a decreasing rate at which the intensity value decreases from the inside intersection to the outside intersection of said second pair, wherein the line intersection data is determined based on trajectories obtained by dragging a diamond-like box between vertices of the polygon to be drawn, said diamond-like box having diagonal dimensions in two coordinate axis directions and each of the diagonal dimensions being equal to a grid width; and

a scan line processing device which sequentially calculates with respect to said given one scan line the intensity value to be given to each portion of the polygon in the scanning direction with respect to said each scan line, based on the line intersection data obtained calculated for said [[each]] given one scan line by said edge calculating device, by performing first processing for calculating changes in the intensity value from the outside intersection to the inside intersection of said first pair for each scan line, second processing for calculating changes in the intensity value from the inside intersection to the outside intersection of said second pair for each scan line, and third processing for combining results obtained in said first processing and said second processing, said first processing, said second processing and said third processing being performed in parallel with each other, said scan line processing device including means for maintaining the intensity value of said each portion inside the polygon constant while gradually changing the intensity value of said each portion along each edge of the polygon,

wherein said edge calculating device and said scan line processing device operate alternately during processing for said given one scan line, whereby a polygon is drawn.

54. (Currently Amended) A polygon drawing apparatus according to claim 53, wherein said edge calculating device comprises:

means for calculating a first pair of positions on lattice points of displayed grid boxes that are located adjacent, respectively, to a pair of real intersections between said [[each]] given one scan line and said one of said edges that is located on the upstream side as viewed in the scanning direction, on the downstream side as viewed in the scanning direction, to obtain said first pair of outside intersection and inside intersection;

means for calculating a second pair of positions on lattice points of the displayed grid boxes that are located adjacent, respectively, to a pair of real intersections between said [[each]] given one scan line and said one of said edges that is located on the downstream side as viewed in the scanning direction, to obtain said second pair of outside intersection and inside intersection; and

means for calculating a first initial value from the intensity value at the outside intersection of said first pair, and a second initial value from the intensity value at a lattice point of one of displayed grid boxes that is located adjacent to the inside intersection of said second pair on the downstream side as viewed in the scanning direction.

55-56. (Cancelled)

57. (Currently Amended) A polygon drawing apparatus according to claim 53, wherein said scan processing device comprises:

means for performing said first processing by generating the intensity value by progressively increasing the intensity value at said increasing rate in a range from the outside intersection to the inside intersection of said first pair for said [[each]] given one scan line and generating a constant intensity value in a range following the inside intersection of said first pair;

means for performing said second processing by generating the intensity value by progressively decreasing the intensity value at an absolute value of said decreasing rate in a range from the inside intersection to the outside intersection of said second pair for said [[each]] given one scan line and generating said constant intensity value in a range following the outside intersection of said second pair; and

means for performing said third processing by subtracting a result of said second processing from a result of said first processing.

58. (Currently Amended) A polygon drawing apparatus according to claim 54, wherein said scan processing device comprises:

means for performing said first processing by generating the intensity value by progressively increasing the intensity value at said increasing rate in a range from the outside intersection to the inside intersection of said first pair for said [[each]] given one scan line and generating a constant intensity value in a range following the inside intersection of said first pair;

means for performing said second processing by generating the intensity value by progressively decreasing the intensity value at an absolute value of said decreasing rate in a range from the inside intersection to the outside intersection of said second pair for said [[each]] given one scan line and generating said constant intensity value in a range following the outside intersection of said second pair; and

means for performing said third processing by subtracting a result of said second processing from a result of said first processing.

59. (Previously Presented) A polygon drawing apparatus according to claim 57, wherein said increasing rate is determined based on a slope of the edge on the upstream side as viewed in the scanning direction, and said decreasing rate is determined based on a slope of the edge on the downstream side as viewed in the scanning direction.

60. (Previously Presented) A polygon drawing apparatus according to claim 58, wherein said increasing rate is determined based on a slope of the edge on the upstream side as viewed in the scanning direction, and said decreasing rate is determined based on a slope of the edge on the downstream side as viewed in the scanning direction.

61. (Previously Presented) A polygon drawing apparatus according to claim 57, wherein when a vertex of the polygon is located between two adjacent scan lines, said scan processing device sets said constant intensity value to a value that depends upon a distance from one of the two adjacent scan lines to said vertex.

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62.   (Previously Presented) A polygon drawing apparatus according to claim 58, wherein when a vertex of the polygon is located between two adjacent scan lines, said scan processing device sets said constant intensity value to a value that depends upon a distance from one of the two adjacent scan lines to said vertex.

63.   (Previously Presented) A polygon drawing apparatus according to claim 53, wherein when a vertex other than vertices at upper and lower ends of the polygon is located between two adjacent scan lines, said scan processing device separately performs processing based on a first distance from the upper one of the two adjacent scan lines to said vertex, and performs processing based on a second distance from the lower one of the two adjacent scan lines to said vertex, and calculates the intensity value by combining results of said processing based on said first distance and said processing based on said second distance.

64.   (Previously Presented) A polygon drawing apparatus according to claim 54, wherein when a vertex other than vertices at upper and lower ends of the polygon is located between two adjacent scan lines, said scan processing device separately performs processing based on a first distance from the upper one of the two adjacent scan lines to said vertex, and performs processing based on a second distance from the lower one of the two adjacent scan lines to said vertex, and calculates the intensity value by combining results of said processing based on said first distance and said processing based on said second distance.

65.   (Currently Amended) A polygon drawing method of drawing a polygon by performing intensity processing on a polygon to be drawn using an anti-aliasing method based on an intensity value generated by an intensity value generating step, said intensity value generating step comprising:

an edge calculating step of calculating line intersection data associated with an intersecting portion between each of edges of the polygon to be drawn, [[and]] for [[each]] a given one scan line, using the vertex coordinates of the polygon to be drawn, said line intersection data including a first pair of outside intersection and inside intersection that represent intersecting positions between said [[each]] given one scan line and one of the edges that is located on an upstream side as viewed in a scanning direction, a second pair of outside intersection and inside intersection that

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represent intersection positions between said [[each]] given one scan line and one of the edges that is located on a downstream side as viewed in the scanning direction, an increasing rate at which an intensity value increases from the outside intersection to the inside intersection of said first pair, and a decreasing rate at which the intensity value decreases from the inside intersection to the outside intersection of said second pair, wherein the line intersection data is determined based on trajectories obtained by dragging a diamond-like box between vertices of the polygon to be drawn, said diamond-like box having diagonal dimensions in two coordinate axis directions and each of the diagonal dimensions being equal to a grid width; and

a scan line processing step of sequentially calculating with respect to said given one scan line the intensity value to be given to each portion of the polygon in the scanning direction with respect to said each scan line, based on the line intersection data obtained calculated for said [[each]] given one scan line by said edge calculating step, by performing first processing for calculating changes in the intensity value from the outside intersection to the inside intersection of said first pair for each scan line; second processing for calculating changes in the intensity value from the inside intersection to the outside intersection of said second pair for each scan line, and third processing for combining results obtained in said first processing and said second processing, said first processing, said second processing and said third processing being performed in parallel with each other, said edge calculating step including a step of maintaining the intensity value of said each portion inside the polygon constant while gradually changing the intensity value of said each portion along each edge of the polygon,

wherein said edge calculating step and said scan line processing step operate alternately during processing for said given one scan line, whereby a polygon is drawn.

66.   (Currently Amended) A storage medium which stores a program that enables implementation of a method of drawing a polygon by performing intensity processing on a polygon to be drawn using an anti-aliasing method based on an intensity value generated by an intensity value generating [[step]]module, said intensity value generating [[step]]module comprising:

an edge calculating [[step]]module of calculating line intersection data associated with an intersecting portion between each of edges of the polygon to be

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drawn, [[and]] for [[each]] a given one scan line, using the vertex coordinates of the polygon to be drawn, said line intersection data including a first pair of outside intersection and inside intersection that represent intersecting positions between said [[each]] given one scan line and one of the edges that is located on an upstream side as viewed in a scanning direction, a second pair of outside intersection and inside intersection that represent intersection positions between said [[each]] given one scan line and one of the edges that is located on a downstream side as viewed in the scanning direction, an increasing rate at which an intensity value increases from the outside intersection to the inside intersection of said first pair, and a decreasing rate at which the intensity value decreases from the inside intersection to the outside intersection of said second pair, wherein the line intersection data is determined based on trajectories obtained by dragging a diamond-like box between vertices of the polygon to be drawn, said diamond-like box having diagonal dimensions in two coordinate axis directions and each of the diagonal dimensions being equal to a grid width; and

a scan line processing [[step]]module of sequentially calculating with respect to said given one scan line the intensity value to be given to each portion of the polygon in the scanning direction with respect to said each scan line, based on the line intersection data obtained calculated for said [[each]] given one scan line by said edge calculating [[step]]module, by performing first processing for calculating changes in the intensity value from the outside intersection to the inside intersection of said first pair for each scan line, second processing for calculating changes in the intensity value from the inside intersection to the outside intersection of said second pair for each scan line, and third processing for combining results obtained in said first processing and said second processing, said first processing, said second processing and said third processing being performed in parallel with each other, said edge calculating [[step]]module including a [[step]]module of maintaining the intensity value of said each portion inside the polygon constant while gradually changing the intensity value of said each portion along each edge of the polygon,

wherein said edge calculating module and said scan line processing module operate alternately during processing for said given one scan line, whereby a polygon is drawn.

67. (Currently Amended) A polygon drawing apparatus which draws a polygon by combining a plurality of triangles and by performing intensity processing on a polygon to be drawn using an anti-aliasing method based on an intensity value generated by an intensity value generating device, said intensity value generating device comprising:

an edge calculating device which receives a drawing command including vertex coordinates of each of the triangles to be drawn and a control bit which indicates whether each edge of each of the triangles is to be drawn, and calculates line intersection data relating to a position of an intersecting portion between said each edge of each of the triangles [[and]] for [[each]] a given one scan line, using the vertex coordinates of each of the triangles to be drawn and the control bit, and an intensity value of the intersecting portion, based on said control bit, wherein the line intersection data is determined based on trajectories obtained by dragging a diamond-like box between vertices of each of the triangles to be drawn, said diamond-like box having diagonal dimensions in two coordinate axis directions and each of the diagonal dimensions being equal to a grid width; and

a scan line processing device which sequentially calculates with respect to said given one scan line the intensity value to be given to each portion of the each of the triangles in the scanning direction with respect to said each scan line, based on the line intersection data obtained calculated for said [[each]] given one scan line by said edge calculating device, said scan line processing device including means for maintaining the intensity value of said each portion inside each of the triangles constant while gradually changing the intensity value of said each portion along each edge of each of the triangles,

wherein said edge calculating device and said scan line processing device operate alternately during processing for said given one scan line, whereby a polygon is drawn.

68. (Currently Amended) A polygon drawing apparatus which draws a polygon by combining a plurality of triangles and by performing intensity processing on the plurality of triangles to be drawn using an anti-aliasing method based on an intensity value generated by an intensity value generating device, said intensity value generating device comprising:

an edge calculating device which receives a drawing command including vertex coordinates of each of the triangles to be drawn and a control bit which indicates whether intensity processing is to be performed on each edge of each of the triangles, and calculates line intersection data associated with an intersecting portion between each edge of each of the triangles to be drawn [[and]] for [[each]] a given one scan line, using the vertex coordinates of each of the triangles to be drawn and the control bit, said line intersection data including a first pair of outside intersection and inside intersection that represent intersecting positions between said [[each]] given one scan line and one of the edges that is located on an upstream side as viewed in a scanning direction, a second pair of outside intersection and inside intersection that represent intersection positions between said [[each]] given one scan line and one of the edges that is located on a downstream side as viewed in the scanning direction, an increasing rate at which an intensity value increases from the outside intersection to the inside intersection of said first pair, a decreasing rate at which the intensity value decreases from the inside intersection to the outside intersection of said second pair, and an intensity value that is set to 1 when said control bit indicates that no intensity processing is to be performed on said each edge of each of the triangles, wherein the line intersection data is determined based on trajectories obtained by dragging a diamond-like box between vertices of each of the triangles to be drawn, said diamond-like box having diagonal dimensions in two coordinate axis directions and each of the diagonal dimensions being equal to a grid width; and

a scan line processing device which sequentially calculates with respect to said given one scan line the intensity value to be given to each portion of the each of the triangles in the scanning direction with respect to said each scan line, based on the line intersection data obtained calculated for said [[each]] given one scan line by said edge calculating device, said scan line processing device including means for maintaining the intensity value of said each portion inside each of the triangles constant while gradually changing the intensity value of said each portion along each edge of each of the triangles,

wherein said edge calculating device and said scan line processing device operate alternately during processing for said given one scan line, whereby a polygon is drawn.

69.   (Currently Amended) A polygon drawing apparatus which draws a polygon by combining a plurality of triangles and by performing intensity processing on the plurality of triangles to be drawn using an anti-aliasing method based on an intensity value generated by an intensity value generating device, said intensity value generating device comprising:

an edge calculating device which receives a drawing command including vertex coordinates of each of the triangles to be drawn and a first control bit which indicates whether each edge of each of the triangles is to be drawn, and a second control bit which indicates whether intensity processing is to be performed on each edge of each of the triangles, and calculates line intersection data associated with an intersecting portion between each edge of each of the triangles to be drawn [[and]] for [[each]] a given one scan line, using the vertex coordinates of each of the triangles to be drawn and the first and second control bits, said line intersection data including a first pair of outside intersection and inside intersection that represent intersecting positions between said [[each]] given one scan line and one of the edges that is located on an upstream side as viewed in a scanning direction, a second pair of outside intersection and inside intersection that represent intersection positions between said [[each]] given one scan line and one of the edges that is located on a downstream side as viewed in the scanning direction, an increasing rate at which an intensity value increases from the outside intersection to the inside intersection of said first pair, a decreasing rate at which the intensity value decreases from the inside intersection to the outside intersection of said second pair, and an intensity value that is set to 0 when said first control bit indicates that said each edge of each of the triangles is not to be drawn, said intensity value being set to 1 when said second control bit indicates that the intensity processing is not to be performed on said each edge of each of the triangles, wherein the line intersection data is determined based on trajectories obtained by dragging a diamond-like box between vertices of each of the triangles to be drawn, said diamond-like box having diagonal dimensions in two coordinate axis directions and each of the diagonal dimensions being equal to a grid width; and

a scan line processing device which sequentially calculates with respect to said given one scan line the intensity value to be given to each portion of each of the triangles in the scanning direction with respect to said each scan line, based on the line intersection data obtained calculated for said [[each]] given one scan line by said

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edge calculating device, said scan line processing device including means for maintaining the intensity value of said each portion inside each of the triangles constant while gradually changing the intensity value of said each portion along each edge of each of the triangles,

wherein said edge calculating device and said scan line processing device operate alternately during processing for said given one scan line, whereby a polygon is drawn.

70. (Currently Amended) A polygon drawing method of drawing a plurality of triangles so as to draw a polygon by combining the plurality of triangles and by performing intensity processing on a polygon to be drawn using an anti-aliasing method based on an intensity value generated by an intensity value generating step, said intensity value generating step comprising the steps of:

inputting a drawing command including vertex coordinates of each of the triangles to be drawn and a control bit which indicates whether each edge of each of the triangles is to be drawn;

~~drawing an interior of each of the triangles with a predetermined intensity using the vertex coordinates of each of the triangles to be drawn and the control bit, while determining an intensity value of said each edge of each of the triangles by referring to said control bit when drawing said each edge of each of the triangles;~~

an edge calculating step of calculating line intersection data relating to a position of an intersecting portion between said each edge of each of the triangles for a given one scan line, using the vertex coordinates of each of the triangles to be drawn and the control bit, and an intensity value of the intersecting portion, based on said control bit, wherein the line intersection data is determined based on trajectories obtained by dragging a diamond-like box between vertices of each of the triangles to be drawn, said diamond-like box having diagonal dimensions in two coordinate axis directions and each of the diagonal dimensions being equal to a grid width, wherein the line intersection data is determined based on trajectories obtained by dragging a diamond-like box between vertices of the polygon to be drawn, said diamond-like box having diagonal dimensions in two coordinate axis directions and each of the diagonal dimensions being equal to a grid width;

a scan line processing step of calculating with respect to said given one scan line the intensity value to be given to each portion of each of the triangles in the

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scanning direction, based on the line intersection data calculated for said given one scan line by said edge calculating step; and

maintaining the intensity value of said each portion inside each of the triangles constant while gradually changing the intensity value of said each portion along each edge of each of the triangles,

wherein said edge calculating step and said scan line processing step operate alternately during processing for said given one scan line, whereby a polygon is drawn.

71. (Currently Amended) A polygon drawing method of drawing a polygon by combining a plurality of triangles and by performing intensity processing on the plurality of triangles to be drawn using an anti-aliasing method based on an intensity value generated by an intensity value generating step, said intensity value generating step comprising the steps of:

inputting a drawing command including vertex coordinates of each of the triangles to be drawn and a control bit which indicates whether intensity processing is to be performed on each edge of each of the triangles;

~~drawing an interior of each of the triangles with a predetermined intensity using the vertex coordinates of each of the triangles to be drawn and the control bit, while determining an intensity value of said each edge of each of the triangles by referring to said control bit when drawing said each edge of each of the triangles;~~

an edge calculating step of calculating line intersection data relating to a position of an intersecting portion between said each edge of each of the triangles for a given one scan line, using the vertex coordinates of each of the triangles to be drawn and the control bit, and an intensity value of the intersecting portion, based on said control bit, wherein the line intersection data is determined based on trajectories obtained by dragging a diamond-like box between vertices of each of the triangles to be drawn, said diamond-like box having diagonal dimensions in two coordinate axis directions and each of the diagonal dimensions being equal to a grid width, wherein the line intersection data is determined based on trajectories obtained by dragging a diamond-like box between vertices of the polygon to be drawn, said diamond-like box having diagonal dimensions in two coordinate axis directions and each of the diagonal dimensions being equal to a grid width;

a scan line processing step of calculating with respect to said given one scan line the intensity value to be given to each portion of each of the triangles in the scanning direction, based on the line intersection data calculated for said given one scan line by said edge calculating step; and

maintaining the intensity value of said each portion inside each of the triangles constant while gradually changing the intensity value of said each portion along each edge of each of the triangles,

wherein said edge calculating step and said scan line processing step operate alternately during processing for said given one scan line, whereby a polygon is drawn.

72. (Currently Amended) A polygon drawing method of drawing a polygon by combining a plurality of triangles and by performing intensity processing on the plurality of triangles to be drawn using an anti-aliasing method based on an intensity value generated by an intensity value generating step, said intensity value generating step comprising the steps of:

inputting a drawing command including vertex coordinates of each of the triangles to be drawn and a first control bit which indicates whether each edge of each of the triangles is to be drawn, and a second control bit which indicates whether intensity processing is to be performed on each edge of each of the triangles;

~~drawing an interior of each of the triangles with a predetermined intensity using the vertex coordinates of each of the triangles to be drawn and the control bit, while determining an intensity value of said each edge of each of the triangles by referring to said control bit when drawing said each edge of each of the triangles;~~

an edge calculating step of calculating line intersection data relating to a position of an intersecting portion between said each edge of each of the triangles for a given one scan line, using the vertex coordinates of each of the triangles to be drawn and the control bit, and an intensity value of the intersecting portion, based on said control bit, wherein the line intersection data is determined based on trajectories obtained by dragging a diamond-like box between vertices of each of the triangles to be drawn, said diamond-like box having diagonal dimensions in two coordinate axis directions and each of the diagonal dimensions being equal to a grid width, wherein the line intersection data is determined based on trajectories obtained by dragging a diamond-like box between vertices of the polygon to be drawn, said diamond-like box

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having diagonal dimensions in two coordinate axis directions and each of the diagonal dimensions being equal to a grid width;

a scan line processing step of calculating with respect to said given one scan line the intensity value to be given to each portion of each of the triangles in the scanning direction, based on the line intersection data calculated for said given one scan line by said edge calculating step; and

maintaining the intensity value of said each portion inside each of the triangles constant while gradually changing the intensity value of said each portion along each edge of each of the triangles,

wherein said edge calculating step and said scan line processing step operate alternately during processing for said given one scan line, whereby a polygon is drawn.

73.   (Previously Presented) A polygon drawing method according to claim 70, wherein the intensity value is determined by a ratio of an intensity value of a pixel that is to be drawn, to an intensity value of a pixel that is originally located at a position where the pixel to be drawn exists, and wherein

when said control bit indicates that said each edge of each of the triangles is not to be drawn, the intensity value of the pixel to be drawn is set to 0.

74.   (Previously Presented) A polygon drawing method according to claim 72, wherein the intensity value is determined by a ratio of an intensity value of a pixel that is to be drawn, to an intensity value of a pixel that is originally located at a position where the pixel to be drawn exists, and wherein

when said control bit indicates that said each edge of each of the triangles is not to be drawn, the intensity value of the pixel to be drawn is set to 0.

75.   (Previously Presented) A polygon drawing method according to claim 71, wherein the intensity value is determined by a ratio of an intensity value of a pixel that is to be drawn to an intensity value of a pixel that is originally located at a position where the pixel to be drawn exists, and wherein

when said control bit indicates that the intensity processing is not to be performed on said each edge of each of the triangles, the intensity value of the pixel to be drawn is set to 1.

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76.   (Previously Presented) A polygon drawing method according to claim 72, wherein the intensity value is determined by a ratio of an intensity value of a pixel that is to be drawn to an intensity value of a pixel that is originally located at a position where the pixel to be drawn exists, and wherein

when said control bit indicates that the intensity processing is not to be performed on said each edge of each of the triangles, the intensity value of the pixel to be drawn is set to 1.

77-78. (Cancelled)

79.   (Currently Amended) A storage medium that stores a program that enables implementation of a polygon drawing method of drawing a plurality of triangles so as to draw a polygon by combining the plurality of triangles and by performing intensity processing on a polygon to be drawn using an anti-aliasing method based on an intensity value generated by an intensity value generating [[step]]module, said intensity value generating [[step]]module comprising the [[step]]modules of:

an inputting module of inputting a drawing command including vertex coordinates of each of the triangles to be drawn and a control bit which indicates whether each edge of each of the triangles is to be drawn;

drawing an interior of each of the triangles with a predetermined intensity using the vertex coordinates of each of the triangles to be drawn and the control bit, while determining an intensity value of said each edge of each of the triangles by referring to said control bit when drawing said each edge of each of the triangles;

an edge calculating module of calculating line intersection data relating to a position of an intersecting portion between said each edge of each of the triangles for a given one scan line, using the vertex coordinates of each of the triangles to be drawn and the control bit, and an intensity value of the intersecting portion, based on said control bit, wherein the line intersection data is determined based on trajectories obtained by dragging a diamond-like box between vertices of each of the triangles to be drawn, said diamond-like box having diagonal dimensions in two coordinate axis directions and each of the diagonal dimensions being equal to a grid width, wherein the line intersection data is determined based on trajectories obtained by dragging a diamond-like box between vertices of the polygon to be drawn, said diamond-like box

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having diagonal dimensions in two coordinate axis directions and each of the diagonal dimensions being equal to a grid width;

a scan line processing module of calculating with respect to said given one scan line the intensity value to be given to each portion of each of the triangles in the scanning direction, based on the line intersection data calculated for said given one scan line by said edge calculating module; and

a maintaining module of maintaining the intensity value of said each portion inside each of the triangles constant while gradually changing the intensity value of said each portion along each edge of each of the triangles,

wherein said edge calculating module and said scan line processing module operate alternately during processing for said given one scan line, whereby a polygon is drawn.

80. (Currently Amended) A storage medium that stores a program that enables implementation of a polygon drawing method of drawing a polygon by combining a plurality of triangles and by performing intensity processing on the plurality of triangles to be drawn using an anti-aliasing method based on an intensity value generated by an intensity value generating [[step]]module, said intensity value generating [[step]]module comprising the [[step]]modules of:

an inputting module of inputting a drawing command including vertex coordinates of each of the triangles to be drawn and a control bit which indicates whether intensity processing is to be performed on each edge of each of the triangles;

drawing an interior of each of the triangles with a predetermined intensity using the vertex coordinates of each of the triangles to be drawn and the control bit, while determining an intensity value of said each edge of each of the triangles by referring to said control bit when drawing said each edge of each of the triangles;

an edge calculating module of calculating line intersection data relating to a position of an intersecting portion between said each edge of each of the triangles for a given one scan line, using the vertex coordinates of each of the triangles to be drawn and the control bit, and an intensity value of the intersecting portion, based on said control bit, wherein the line intersection data is determined based on trajectories obtained by dragging a diamond-like box between vertices of each of the triangles to be drawn, said diamond-like box having diagonal dimensions in two coordinate axis directions and each of the diagonal dimensions being equal to a grid width, wherein

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the line intersection data is determined based on trajectories obtained by dragging a diamond-like box between vertices of the polygon to be drawn, said diamond-like box having diagonal dimensions in two coordinate axis directions and each of the diagonal dimensions being equal to a grid width;

a scan line processing module of calculating with respect to said given one scan line the intensity value to be given to each portion of each of the triangles in the scanning direction, based on the line intersection data calculated for said given one scan line by said edge calculating module; and

a maintaining module of maintaining the intensity value of said each portion inside each of the triangles constant while gradually changing the intensity value of said each portion along each edge of each of the triangles,

wherein said edge calculating module and said scan line processing module operate alternately during processing for said given one scan line, whereby a polygon is drawn.

81.   (Currently Amended) A storage medium that stores a program that enables implementation of a polygon drawing method of drawing a polygon by combining a plurality of triangles and by performing intensity processing on the plurality of triangles to be drawn using an anti-aliasing method based on an intensity value generated by an intensity value generating [[step]]module, said intensity value generating [[step]]module comprising the [[step]]modules of:

an inputting module of inputting a drawing command including vertex coordinates of each of the triangles to be drawn and a first control bit which indicates whether each edge of each of the triangles is to be drawn, and a second control bit which indicates whether intensity processing is to be performed on each edge of each of the triangles;

~~drawing an interior of each of the triangles with a predetermined intensity using the vertex coordinates of each of the triangles to be drawn and the control bit, while determining an intensity value of said each edge of each of the triangles by referring to said control bit when drawing said each edge of each of the triangles;~~

an edge calculating module of calculating line intersection data relating to a position of an intersecting portion between said each edge of each of the triangles for a given one scan line, using the vertex coordinates of each of the triangles to be drawn and the control bit, and an intensity value of the intersecting portion, based on

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said control bit, wherein the line intersection data is determined based on trajectories obtained by dragging a diamond-like box between vertices of each of the triangles to be drawn, said diamond-like box having diagonal dimensions in two coordinate axis directions and each of the diagonal dimensions being equal to a grid width, wherein the line intersection data is determined based on trajectories obtained by dragging a diamond-like box between vertices of the polygon to be drawn, said diamond-like box having diagonal dimensions in two coordinate axis directions and each of the diagonal dimensions being equal to a grid width;

a scan line processing module of calculating with respect to said given one scan line the intensity value to be given to each portion of each of the triangles in the scanning direction, based on the line intersection data calculated for said given one scan line by said edge calculating module; and

a maintaining module of maintaining the intensity value of said each portion inside each of the triangles constant while gradually changing the intensity value of said each portion along each edge of each of the triangles,

wherein said edge calculating module and said scan line processing module operate alternately during processing for said given one scan line, whereby a polygon is drawn.

82.   (Previously Presented) A polygon drawing method according to claim 72, wherein the intensity value is determined by a ratio of an intensity value of a pixel that is to be drawn, to an intensity value of a pixel that is originally located at a position where the pixel to be drawn exists, and wherein

when said control bit indicates that each edge of the triangles is not to be drawn, the intensity value of the pixel to be drawn is set to 0.

83.   (Previously Presented) A polygon drawing method according to claim 72, wherein the intensity value is determined by a ratio of an intensity value of a pixel that is to be drawn to an intensity value of a pixel that is originally located at a position where the pixel to be drawn exists, and wherein

when said control bit indicates that the intensity processing is not to be performed on said each edge of each of the triangles, the intensity value of the pixel to be drawn is set to 1.

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84. (Cancelled)